ANALISIS STRUKTUR LAPISAN TANAH BERDASARKAN KETEBALAN SEDIMEN DAN IDENTIFIKASI RESIKO GEMPABUMI DI KABUPATEN KULON PROGO MENGGUNAKAN MIKROTREMOR

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ABSTRAK

Penelitian ini bertujuan untuk mengetahui struktur lapisan tanah berdasarkan ketebalan sedimen dengan menggunakan metode HVSR dan melakukan pemetaan tingkat resiko gempabumi di Kabupaten Kulon Progo berdasarkan nilai faktor amplifikasi dan ketebalan sedimen. Penelitian dilakukan di wilayah Kabupaten Kulon Progo yang dimulai dengan pengambilan data mikrotremor dari 38 titik lokasi. Data mikrotremor kemudian dianalisis menggunakan metode *Horizontal to Vertical Spectral Ratio* (HVSR) untuk mendapatkan frekuensi predominan dan faktor amplifikasi di setiap titik penelitian. Hasil analisis mikrotremor digunakan untuk menentukan nilai ketebalan sedimen (*H*), yang kemudian diolah untuk dapat diketahui penyusun struktur lapisan tanah.

Hasil penelitian ini menunjukkan bahwa struktur lapisan tanah di wilayah bagian utara Kabupaten Kulon Progo dengan ketebalan sedimen < 22 m tergolong pasir berkerikil keras. Struktur lapisan tanah di wilayah bagian tengah Kabupaten ini dengan ketebalan sedimen < 25 m tergolong pasir, pasir berkerikil, dan lempung, sedangkan ketebalan sedimen > 25 m tergolong pasir, pasir berkerikil, lempung, lempung gampingan. Struktur lapisan tanah di wilayah bagian selatan Kabupaten ini dengan ketebalan sedimen < 15 m tergolong pasir; ketebalan sedimen 15 m sampai 30 m tergolong pasir dan lempung; ketebalan > 30 m tergolong tanah lembek yaitu lempung, tufa, dan napal. Pemetaan tingkat resiko gempa dalam satuan kecamatan adalah: kecamatan dengan resiko tinggi berada di Kecamatan Samigaluh bagian utara, Kecamatan Kalibawang bagian barat, Kecamatan Wates, Kecamatan Lendah bagian timur, Kecamatan Galur bagian utara, Kecamatan Temon, dan Kecamatan Panjatan bagian utara karena kecamatan tersebut memiliki nilai faktor amplifikasi tinggi yang didukung dengan ketebalan sedimen tebal. Wilayah dengan resiko sedang berada di Kecamatan Girimulyo, yaitu Desa Purwosari (TA9) dan Desa Jatimulyo (TA12) , serta Kecamatan Pengasih pada Desa Sidomulyo (TA16). Wilayah dengan resiko rendah berada di Kecamatan Nanggulan, Kecamatan Sentolo, Kecamatan Kokap, dan Kecamatan Samigaluh bagian selatan.

Kata kunci: *Struktur lapisan tanah, Horizontal to Vertical Spectral Ratio, mikrotremor, pemetaan resiko gempa, Kulon Progo*

THE ANALYSIS OF SOIL LAYER STRUCTURE BASED ON SEDIMENT THICKNESS AND IDENTIFICATION OF EARTHQUAKE RISK BY USING MICROTREMOR IN KULON PROGO REGENCY

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ABSTRACT

The aim of this study is to identify the soil layer structure based on sediment thickness using HVSR, and to find out the risk of earthquake based on the value of the amplification factor and the thickness of the sediment by mapping in Kulonprogro Regency. The area of this study was in Kulon Progo by taking the microtremor data from 38 points. The microtremor data was analyzed using Horizontal to Vertical Spectral Ratio (HVSR) method to get the predominant frequency and amplification factor at each point. The results of the analysis was used to determine the value of microtremor sediment thickness (H), then it was processed to see the soil layer structure.

The results of this study indicate that the structure of the soil layer in the northern region of Kulon Progo Regency is sediments with the thickness of < 22 m and classified as hard pebbly sand. The structure of the soil layer in the central part of the district with a sediment thickness of < 25 m is classified as sand, gravel sand, and clay, while the sediment thickness > 25 m classified as sand, gravel sand, clay, calcareous clay. The structure of the soil layer in the southern part of this district with a sediment thickness of < 15 m is classified as sand; sediment thickness of 15 m to 30 m is classified as sand and clay; sediment thickness > 30 m is clay, tuff, and marl. Mapping of the level of earthquake risk in the sub-district units are: districts with high risk are located in northern part of Samigaluh District, western part of Kalibawang District, Temon District, Wates District, eastern part of Lendah District, northern part of Galur District, and northern part of Panjatan District. Those districts have a high amplification factor values which are supported by thick sediment thickness. The area which has intermediate risk is in Purwosari village (TA9) and Jatimulyo village (TA12) of Girimulyo District, and also Sidomulyo village (TA16) of Pengasih District. Areas with low risk are located in Nanggulan, Sentolo, Kokap District, and southern part of Samigaluh.

Keywords: *soil layer structure, Horizontal to Vertical Spectral Ratio, microtremor, mapping of earthquake risk, Kulon Progo.*